

Abstract of the invention

A ceramic cutting tool configured as multiphase ceramic with an improved resistance to wear of the edge area or edge layer consists of a base ceramic and of a sacrificial phase as well as eventually additives and primary hard material phases and an eventually multilayered edge area or edge layer resistant to wear, hard, not deposited made of at least one hard material phase, whereby the edge area is intimately intergrown with the starting ceramic and which is formed by aging the starting ceramic in a defined atmosphere.

Fig. 1

10 - Starting ceramic consisting of
 base ceramic, for example
 additives, for example
 sacrificial phase, for example
 primary hard material phase, for example
 20 - Edge area or edge layer, for example

Fig. 3

A - Powder compound
 B - Powder processing
 Attritor grinding 7 h, 700 rpm, in acetone, X-TZP grinding balls
 C - Powder conditioning
 Drying, screening
 D - Green body production
 Pressing uniaxial
 cold isostatic
 E - Reaction sintering
 vacuum, after Argon rinsing
 F - Hard machining
 grinding
 G - High-temperature isostatic pressing
 H - Cutting plate

Fig. 4

Powder processing
 A Powder compound
 B Attritor grinding
 Acetone, grinding balls, container
 C Drying/screening
 D Green body manufacturing

uniaxial pressing
cold isostatic pressing
E Reaction sintering
vacuum
pores
F Hard machining
G High-temperature isostatic pressing argon
H Cutting plate

Fig. 5

Junction area
Basic structure

Fig. 6

Scanning electron microscope photos
Element concentration

Fig. 7

Cutting time
Width of wear land
Travel of the cutting tool
sintered
reference - high-temperature pressed
Fractures
Cutting ceramic according to the invention
Cutting speed
Cutting depth
Forward feed